Prob A) Imagine a given amount of charge $Q$ is distributed over a closed surface as described by a spatially varying charge density $\sigma(x)$. Starting with an expression for the energy of the configuration, show that the energy will be minimum when the charge is distributed in such a way so as to make the potential constant on the surface. Mathematically this involves what is known as the calculus of variations. What is the electric field inside the surface. Now construct a physical argument using a conductor to reach the same conclusion